# MOVIETONE BULLETIN

Published in the interest of the Movietone Projectionist by

FOX CASE CORPORATION

460 WEST 54TH ST., NEW YORK

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## *Making Splices*

FROM St. Louis comes this query: "I'm not projecting movietone yet, but expect we will have it soon now. Will you be good enough to tell me just how a movietone splice should be made? Is it any different from an ordinary splice? Will the Bluebook splice-making directions serve?"

Splices in movietone film are the same as those in ordinary film, except. But the exception is quite simple. An ordinary splice will cause a click as it passes through the sound gate. However, if the sound band be coated with black at the splice it will be almost perfectly quiet—that is it will if the splice be otherwise correctly made. The Bluebook directions will serve perfectly, in so far as concerns making the actual splice.

You will be supplied with a suitable black, quick drying lacquer. This must be applied, **not** to the emulsion side, but to the back or celluloid side of the film. It should be in the form of a triangle, with its peak on the splice edge and at the inner edge of the sound band. Its base should reach a distance equal to ⅜ to ½ inch and no more. If you make it too short there will be a click. If too long you cut out sound unnecessarily. You will be shown how to do this correctly by the engineers who make the installation in your theatre, so there is no need to worry. The figure explains the right and wrong way.

In making splices, don't cut out a single frame more than is absolutely necessary, because if you do you not only will unnecessarily eliminate action but also sound. Just make a good, firm splice, exactly the same as you would with silent film, being very certain to scrape off all the emulsion and to roughen the back (celluloid) side of the other end. Don't use too much cement and **don't brush the cement** by drawing the brush back and forth. If you do you will not have a strong splice. Cement must be applied with just one stroke to get best results. Just at the moment I can't recall just why this is so, but just the same it **is** so.

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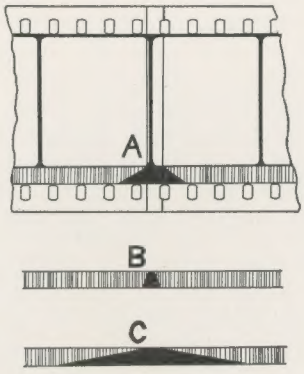
Have patience. This is a democracy. And a democracy is that form of government under which a fellow with a market on the corner may some day have a corner on the market.

### To Paint Out Splice Noise




A—Correct method, quiet.
B—Too short, will click.
C—Too long, keeps sound off.

## *Marvelous Movietone*

HOW many movietone projectionists have, I wonder, given consideration to the astounding thing done by the apparatus they are handling. To the one who understands just what the apparatus does in the matter of sound amplification, the thing is intensely interesting. The purpose of this article is to attempt to convey some idea of the enormous delicacy of the operation performed by the apparatus placed in your hands by movietone and the Western Electric Company, trusting to you to obtain from it, or cause it to deliver the maximum of its very wonderful capabilities.

Doubtless many of you have read articles in which scientists have gravely informed us that there are living organisms so minute that billions or even trillions of them may actually live in and move about in a single drop of water.

Such statements mean little to the average mind, or to any mind for that matter, save only that of a scientist or an engineer trained to their consideration. To the average person they are utterly beyond comprehension.

However, you've not heard anything yet! Not only do scientists tell us that astoundingly un-understandable thing, but they then proceed to rub it in by further advising us that each one of this vast horde of organisms will have, relatively speaking, as much room to move about in as you or I would have in the Atlantic ocean. Even that doesn't satisfy their soaring

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imaginations, and they tell us that inside the atom, which is itself a thing so small that it may not be seen even with the aid of the most powerful microscope, are still smaller objects, called electrons, which are negative particles of electricity, and that each electron will have as much room to play about in as does one of our planets in the solar system. And mark you well, these gentlemen of learning mean these electron particles will have all that room without passing outside the confines of the atom! Laugh that off if you feel able to.

Such statements seem almost foolish to the untrained mind. To them the thing is past all comprehension and I sometimes wonder if friend scientist isn't spoofing both himself and We, Us & Company a wee bit.

But then after all I dunno! I think of a few feet of small wire wound on a frame, often not to exceed eighteen inches square, located perhaps inside thick concrete, brick or stone walls. I consider the fact that it picks up electrical vibrations emitted by another wire located say 1,500 miles away, passing them along to a dinky little piece of apparatus something like eight inches square by maybe eighteen long, which same is connected with a loud speaker, from which, marvel of marvels, comes the perfectly natural voice of a man (static excepted) who is speaking in ordinary conversational tone of voice at a place one thousand five hundred miles away. And when I hear the voice reproduced so marvelously well, with every little tonal peculiarity, just as though the speaker stood by my side, I begin to wonder if after all Mr. Scientist is so very crazy in his statements.

And now we get down to what this blurb is all about, and the reason for its writing.

We have said that you men who project movietone must not only be "in the know" concerning the apparatus you are called upon to handle, but also that you must be and remain at your post of duty beside the projector, with your "hand on the throttle" every moment of the time.

You are handling forces inconceivably small and weak—so much so that they are analogous to the smallness of the organisms and electrons the scientist tells us about. In this I refer to the train of impulses delivered by the projector photo-cell to the vacuum amplifying tubes.

We hear the loud speakers or "horns" filling a large theatre auditorium with sound. Apparently there is lots and lots of power available, and so there usually is, but (and here is the basis of this whole talk) the initial strength of the photo-cell output is so inconceivably small that it must be built up or "amplified," by the apparatus you are handling, more than 100,000,000 times before it is able to operate the horns acceptably.

Gentlemen, an apparatus which is able to do a thing like that most certainly is justly entitled to your highest respect. You should feel honored in being permitted to handle it. Into your keeping is entrusted apparatus which, under your guidance, can and does receive electrical impulses so weak that they may be compared with one dollar and its relation to the entire fortune of John D. Rockefeller or Henry Ford. It receives these impulses and, without the loss of even so much as the millionth of a second of time, builds them up, or amplifies them until they have power to operate a horn or horns and fill a great auditorium with sound, which sound will be in every way, down to even the most minute variation of tonal effect, an exact reproduction of the sound the microphone "heard" and caused to be recorded on the sound band of the film.

I sometimes feel like removing my hat when I pick up a reel of movietone—remove it out of respect for the miracle it holds, and out of respect for the master minds who have made the thing possible.

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You see a lot of news-reel shots taken from airplanes. We asked the cameraman if that wasn't a rather ticklish job. He says there is no reason why it should be—nothing on earth can happen to you.

# FLICKERS

Regulating the volume of movietone should quickly become instinctive to the projectionist. Do you know what instinct is? Instinct is that faculty which enables you, the moment the boss enters the room, to tell he will be in a bad humor the rest of the day.

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We are not able to verify it, but we have heard a rumor that St. Peter has ordered a movietone recorder installed in his office so there won't be any argument as to what the applicants for admission to his realm said or didn't say in the process of qualifying themselves.

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The news cameramen have to be careful in taking sound films of street scenes. If they should happen to catch a truck driver in a traffic jam what he would say would play the devil with the recording apparatus.

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No matter what your work is, get down to business. The time to get down to business is about nine o'clock in the morning, unless you are the boss.

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Have a head of your own. It is no particular distinction to be able to follow somebody else's lead. That's what they put halters on jackasses for.

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Every man to his calling. If you can't deliver the goods any other way get a horse and wagon and hire out to a grocery store.

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The Office Boob says the screen ought to be a subject easily understood — there is so much light thrown on it.

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There is always room at the top. In fact, there is more than that—there is room and board.

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Movietone Mike says his girl calls him "Atom" because she can't see him.

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Of course, movietone is the talk of the town—that's its business, to talk.

# *The How and Why*

SEVERAL projectionists, movietone and otherwise, have asked the same question, though of course in somewhat different words. Boiled down it is this: Just how and why does a vacuum tube amplify sound?

A fair question, though not an easy one to answer in such manner that the non-technical man will have a clear understanding of the matter. However, provided the engineers will permit what I shall say to get past them, I will attempt to explain in non-technical language. Please remember that it may be necessary to make some sacrifice of strict technical correctness, if I am to really make you understand. In the main, though, the things set forth will be correct. I hope they will also be intelligible.

In a vacuum tube such as we use for sound amplification, there are three elements, or "electrodes" as they are usually termed by technical men. They are called respectively the "filament" the "grid" and the "plate." The grid is located between the filament and the plate. It is in effect an electrical valve which controls amplification of sound, as will hereinafter be set forth.

The filament is heated by the "A" battery and when so heated has what is termed "electrons" boiled out of it. Put in another way, it throws off electrons, which consist of and are tiny particles of electric energy, or current, negatively charged. Electrons are only boiled out or thrown off by a hot conductor in a vacuum. They travel in straight lines and at high velocity.

The plate is positively charged by the "B" battery. It is connected to the output circuit, or in other words to the sound reproducing apparatus.

Positive attracts negative, as you all know, hence, (disregarding the grid for the moment,) since the plate carries a positive and the filament a negative charge, the plate would attract to it most of the electrons thrown off by the filament, or indeed practically all of them if the plate voltage be high enough.

But between the filament and the plate is the grid, carrying a negative charge supplied by the "C" battery, and that is the real secret of the whole business. Not only is negative attracted by positive as before set forth, but it is repelled by negative. That is to say, two negative charges will not attract each other, but on the contrary will repel each other. Remembering, then, that between the negative electron-emitting filament and the positively charged plate is the negatively charged grid, it follows that the flow of electrons will be opposed, and **opposed in exact proportion to the negative voltage applied to the grid, hence any variation in or of the grid voltage will cause a corresponding change in the plate current,** and it is by changing the grid voltage that we are able to alter the plate current at will.

The amount of power required to operate the grid and cause the desired changes is negligible, but we can take a relatively large amount of power from the plate. In other words **in the vacuum tube we have the means for using a very small amount of power to control a relatively large amount of power.** It requires a very slight exertion to push down the accelerator of your car, but the use of that small effort operates to release and make available the full power of the engine. Vacuum tube amplification action is much the same. It is a valve action. In fact, in Europe vacuum tubes are called "valves."

The impulses from the movietone photo-electric cell are very, very weak—much too weak to operate even the most delicately adjusted apparatus. It would, therefore, be impossible to transform them into audible sound until and unless they be made much stronger. We therefore conduct these weak impulses to the grid of a vacuum tube, where they act to set up exact copies of themselves in the plate circuit, only those "copies" are vastly stronger than the original impulses. The more intense the fluctuations, the louder will be the sound produced for any given degree of amplification.

And thus, through the flow of electrons from filament to plate we have amplification, and by the action of what amounts to an electric valve (the grid) we are able to control the amplification and secure the desired results in sound amplification.

Recapitulation: The heated filament throws off negatively charged electrons, the quantity so emitted being in proportion to the temperature of the filament, up to its operating capacity. The flow of these electrons constitutes the current which will operate the sound reproducing apparatus when governed and controlled by the voltage impressed upon the grid, which latter comes from and is controlled by the photo-electric cell at the projector.

I might add that since the capacity for amplification by one vacuum tube would be entirely inadequate to operate a loud speaker, two or more of the tubes are connected in series, or in parallel, like batteries, by which means the power is built up to any desired point.

Note: The Wise Ones need not waste time starting to pick the foregoing to pieces. All I have attempted to do is to make clear the basic principles upon which vacuum tubes operate in producing sound amplification. When that is understood, the study of the technique becomes far more easy; also I am firmly convinced that men who have a clear understanding of the basic principles upon which any apparatus depends for its action will, in the end, be able to handle the apparatus far better and more efficiently.

I shall follow this article presently with another, explaining just in what manner a vacuum tube is made to act as a current rectifier. Later, other phases of the apparatus will be explained in a similar manner. If there are any points you would like to have dealt with, please advise the editor and it will be attended to as soon as possible.

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Movietone Mike knows his onion tops when it comes to film technique. Everybody says his new girl is negative. Mike says that's all right—he'll develop her.

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Part of the 5th commandment was aimed at projectionists—honor thy fader.

## *Tube Renewal*

A WESTERN projectionist: "Dear Mr. Richardson: I find the Bulletin very helpful and like it very much indeed. Will you be good enough to advise us as to how we may know when the amplifying tube and the rectifying tube should be renewed? By that I mean to ask how we may determine when any individual tube has passed its point of usefulness."

There are three conditions which are easily detected by the projectionist, the presence of either of which indicates that an amplifier vacuum tube is reaching the end of its life:

1. As a tube filament ages it develops weak spots at one of which it eventually breaks. These weak spots glow more brightly than the rest of the filament when it is lighted. Therefore, whenever you begin to notice that one part of the filament is decidedly brighter than the remainder, approaching filament breakage is indicated and the tube should be replaced.
2. Some filaments become slack and develop sagging as they age. This may have undesirable effects on the amplification. A tube should, therefore, be renewed as soon as the filament begins to droop very noticeably.
3. Some tubes become noisy as they age—that is, they cause frying, crackling, or popping noises to be heard in the sound projector horns. If such trouble is observed, inspect the tubes to see if any of the filaments have bright spots, or if any are sagging. If not, try replacing each tube in turn with a new tube. When the bad tube is reached the noise will disappear as soon as the new one is inserted.

## *Muscles are Cheap*

The one great difference as between the animal and the human is the ability of the latter to reason —to think for himself. There is a trite and true saying: "Muscles are cheap; use your brain."

The elephant has muscular strength probably fully equal to the combined strength of a hundred men, yet one man directs and guides the elephant and compels the great brute to work for him.

Our mentality is made the more efficient by use. It is the man who studies and thinks who in the end gets ahead in any profession or business. That, I think you all will agree is pretty nearly true, and "any profession or business" includes projection.

If a projectionist comes on the job each day merely to go through a certain routine, get that day over and done with and in due course draw his pay for it, that man will never amount to much in the profession.

The really successful projectionist, movietone or otherwise, takes a real interest in his work. He uses his brains. He thinks. He studies it and by study sharpens his mentality. When an emergency comes, as come it frequently does, he thinks clearly and quickly.

Clear, quick thinking is no special dispensation of providence. It is the product of mental activity—study. Mental laziness is as bad or even worse than physical laziness, and both are quite bad enough. Use your brains, muscles are cheap.

## *Testing Before Show*

DON'T be an "I Guess So" projectionist. Know your equipment is in the very pink of condition from the sound lamp clear through to the horns. That is the only right way and the only way to give the audiences one hundred per cent. of the possible amusement and dramatic value of movietone.

Begin at the sound lamp and go clear through. Check the sound lamp carefully for position, discoloration and filament sag, and see to it that the meter reads just 3.6 amperes.

Next **carefully** examine the sound gate to see that there is no deposit, dirt or lint adhering. Next once-over the sound sprocket to make certain its faces are perfectly clean. A bit of dirt on one of them will cause trouble, you know. Makes the sound "wobble" as it were, and that sort of wobble is not appreciated by audiences.

And while you are on sprockets, examine the projector intermittent sprocket to see that it is perfectly clean and the projector aperture, too, to make certain there are no bits of dust adhering to its edges, which will show on the screen in the form of cobble stones.

Next examine the photo-electric cell to see that it is in proper position for the beam to pass into it, and that the window is perfectly clean. Check the sound attachment amplifier filament current by means of the meter.

You are now ready to check up on the main amplifier filament and plate current and the plate voltage. Take careful readings and any departure from normal must be traced back to its cause and the cause removed.

Check the amplifier equipment through exactly as per the instruction in your instruction book which applies to your particular equipment. Test each of the speakers individually.

What's that? A lot of trouble to do this before each show?

Well, brother, it's a lot of trouble for a locomotive engineer to keep the proper water level in the boiler, to watch continually for signals etc., but if you were a passenger you would call him a pretty poor specimen if he did not do so, would you not? "Great scott, man, you're paid to do all that, aren't you?" I think I can hear you tell him; also if you found him negligent and unwilling to take the trouble to do his work pretty nearly exactly right I'll wager my suspenders against your belt that you would **not** ride behind that engineer again if you could help it!

Think that over for a while, brother—and see if the same argument will not apply to the projectionist who is too lazy to do his work right—if any there be.

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Isn't it great to hear the audience applaud a movietone performance? True it may be applauding the marvelous movietone effect, but nevertheless some portion of the applause is your honest due, because had you not done your work right—been a capable, painstaking movietone projectionist who did his work well—the effect as viewed by that audience would not have been anything very marvelous. Moreover, audiences are slowly beginning to understand something of the importance of your work, so really the applause is partly for you. Gosh! Isn't it a grand and glorious feeling!

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You may buy your wife a washing machine—but it's up to you to keep the sound gate clean.

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Published in the interest of the Movietone Projectionist by

FOX CASE CORPORATION

460 WEST 54TH ST., NEW YORK

VOLUME 1, NO. 32 — 42S. — AUGUST 11, 1928


# *Movietone Projectionist*

IT IS the desire of the Fox Case Company that movietone projectionists have and feel a personal interest in movietone. The company wants you to feel that you men who place its product before the public are looked upon as a part and parcel of the organization, even though you may not be directly employed by it.

We want you to feel, as we feel, that movietone is by far the best apparatus now before the public in sound-synchronizing motion pictures, and that we may all feel a justifiable pride in it.

We want you to feel that being a movietone projectionist really means something. It is something more than mere projection. It is something which requires the exercise of judgment and application of high grade knowledge and skill. It is something that keeps the projectionist "on his toes," but repays the added effort with real appreciation and applause by audiences, part of which the movietone projectionist can justly feel is his own due.

We naturally take pride in the splendid results we have been able to place on the film. We hope and believe you take a very real pride in so projecting our product that theatre audiences will receive the full benefit. If you do that we welcome you most cordially as one of what we like to call the "movietone family." Moreover, we want you to feel that the Fox Case Corporation is willing to do and will gladly do any reasonable thing to help you make good as a movietone projectionist.

(Signed) COURTLAND SMITH.

# *Clean Film Essential*

AS ANY movietone projectionist very well knows, it is impossible to produce a clear, sparkling picture except with clean film. We all know that if movietone or any other screen image is to be placed before audiences at 100 per cent. of its dramatic and amusement value, the films themselves **must** be clean. We all know, too, that the receipt of dirty or oil-spotted film from exchanges is the rule rather than the exception. That last is not said in criticism. It is made as a statement of a well known fact.

Movietone projectionists like to place a perfect screen image before their audiences. They cannot do it with oily or dirty film, and are fully justified in making vigorous protest both to the theatre management and to the exchange when oily or dirty films are received.

It may, I think, be fairly assumed that exchanges in effect contract to deliver to the projectionist films in as nearly as may be perfect physical condition. I believe that were the matter made the subject of court action, any court would interpret the contract to mean that between exhange and theatre most emphatically oily or dirty film is **not** in "as nearly as may be perfect physical condition." It is not even in good condition.

It must be remembered that a beautiful, clear, sparkling screen image will, in the long run, bring to the box office decidedly greater revenue than will a consistently splotchy, dull image such as we get from dirty or oily film. Exhibitors will do well to ponder that last statement. It means cash money to them.

Movietone producers can and do give you productions from which a beautiful, sparkling screen image may be projected. If you permit their injury by oil or dirt—well, that is a matter between you and your exchange. The producer has done his part.

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If you think projection worries are too trying and you lead a hard life and there is no relief from the strain, just consider the poor bungalow. It only gets plastered once in a lifetime.

## *Don't Guess*

Don't work by guess in the matter of movietone sound. There is but one right way and that is to cue the fader before you show any movietone subject to an audience. The producer cannot do this because of the vast difference in sound requirements in various auditoriums.

As we have already advised you, there is but one correct way to cue movietone and that is to station some competent observer in that portion of the auditorium which experience tells you is best suited for the purpose, (it will vary somewhat with auditoriums), and with no audience present, have the observer, by means of suitable signals, direct the raising and lowering of sound for each scene until it is at maximum value for that auditorium.

The projectionist of course, will make a cue sheet for the fader in accordance with the observer's direction and thereafter while that same production is used, the sound may always be kept at maximum by following it.

Note: It must be remembered that with the cue sheet made in an empty auditorium it probably will be necessary to add one or two points to the reading when the said auditorium is filled with people. This is largely due to the fact that an audience makes a great deal of noise; also the forms of the people probably interfere to a certain extent with the sound waves.

Gentlemen, you may work without a cue sheet, but when you do you are working merely by guess. You are not doing your duty by movietone and by the theatre patrons who have paid for and are entitled to receive maximum results. That the manager does not demand that a cue sheet be made does not excuse **you.** You are the projectionist and it is up to you, not the manager, to see to it that the best possible results be placed before "your" audiences.

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## *Lens Barrel Reflection*

A southern movietone projectionist says: "Dear Mr. Richardson: I have a queer effect which I am unable to find the cause of. Recently I took my projection lenses apart and very carefully cleaned all lenses, as I have always done once every three months.

That day I noticed when projector No. 1, (the left hand projector. Ed.), was running there was a very faint ring of light around the screen. It is probable the audience would not notice it, but it doesn't belong there and I don't want it. I have disassembled the lens of that projector and everything seems to be all right. Can you help me in this? Please wire at my expense."

This is the day letter I sent him: "Cause undoubtedly is reflection from interior of lens barrel, which you must have rubbed with something. Paint it with coach painters' black thinned with turpentine."

This wire came next day: "Thanks. You're a wizard. Paint did the trick."

I might say to you all that cleaning the interior of your projection lenses once in ninety days is good dope. When you do this, however, do not touch the interior of the barrels, but examine them carefully, and if the coating is not in perfect condition, using a small camel hair brush, recoat the barrel interior with a thin mixture as per my wire to the southern brother.

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## *The Sound Gate*

For the benefit of the many projectionists who have within the past few weeks been added to the family of movietone projectionists, let me direct attention to the necessity for **very carefully** examining the sound gate after each run, making absolutely certain that no dirt adheres to it.

A wee bit of deposit gathers more deposit rapidly and soon will be scratching the sound band, which means serious injury and possibly a ruined reel of film. You must look and feel very carefully and if there is even the least bit of roughness, remove it with your dampened finger. **Never scrape it off** with a steel instrument or any other hard substance. If you do you will roughen the surface so that deposit will form very quickly. Water is the thing. Just dampen your finger and rub the deposit off.

## FLICKERS

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A fan tells us that movietone sounds a lot like radio. Yes, but there is this advantage. You don't have to stand by while the announcer reads a whole bunch of telegrams.

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You can't always tell how much damage an automobile accident does. We know one that wrecked one automobile, two homes and five or six sets of nerves.

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Help the manager keep down expenses. If you have never run a business or had to buy millinery you don't know what overhead expense is.

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Be economical with the property entrusted to your care. Economy is the art of cutting enough off the grocery bill to buy a spare tire for the flivver.

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According to the society news there are a lot of quiet weddings. According to the divorce news the quietness doesn't last very long.

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You can't always judge by appearances. Stealing a kiss sounds as if it ought to be petty larceny, but a lot of girls think it is grand.

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Don't always be looking for something to happen. A pessimist is a guy whose day dreams are nightmares.

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A reformer is a guy who is willing to let good-enough alone. The trouble is he can't find anything good enough.

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You can't keep a good man down if he keeps up. If you want to take things easy be a shoplifter.

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Give the boss a break. If time is money a lot of hired help are embezzlers.

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The darkest hour is just before dawn. No wonder it is so hard to find the keyhole then.

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Watch your step. After all, the corkscrew is just a straight piece of wire that went crooked.

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# *Movietone Pick-up System*

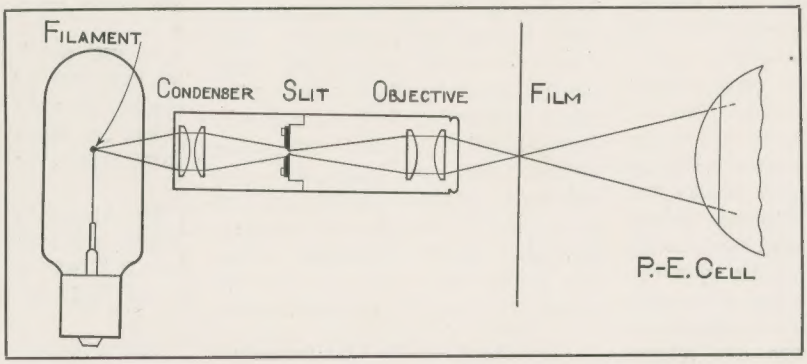
MOVIETONE projectionists will find the screw holding the tube containing the slit immediately in front of the exciting lamp, sealed. This is for the reason that it, the slit, must be located with such extreme accuracy that the projectionist would find great difficulty in performing the operation. So accurate must this adjustment be, that it is made at the factory by means of a specially constructed microscope.

The slit is well protected. The likelihood of anything getting into or upon it is extremely remote. Should you suspect anything of that sort to have happened—and it is possible, though, as I have said, highly improbable—have the service man get on the job and examine it. It is strictly a service man job.

By way of explanaton, the light source is the straight coil filament of the exciting or "sound" lamp. As you all know, a point source of light would be ideal for motion picture projection, but as you also all know it cannot be used because it could not supply sufficient illumination. So also a line source—source having length but without appreciable width—would be ideal for an exciting lamp. That, too, is impossible, however, so in lieu thereof the slit is interposed, which gives us what amounts to a secondary light source in the form of a line of suitable length, having the light cut off cleanly and sharply by the two carefully adjusted knife edges which form its sides.

The light from the exciting lamp passes through a condenser, as you may see by examining the accompanying diagram, and is focused at the slit in the form of a spot much in the same manner the light beam is made to cover the projector aperture. In the side of the slit barrel is a window through which the spot of light at the slit may be observed and adjusted by the projectionist.

**Optical System for Sound Pick-up**




As you will see by examining the diagram, the slit cell also carries an objective lens combination, the office of which is to project an image of the slit, in just the right proportion of reduction to the sound band of the film as it passes thru the sound gate.

Now the slit is very narrow. It is scarcely more than a line itself, located in a horizontal, not a vertical position, and when its image is projected to the sound band in still further reduced form, and in correspondingly greater brilliance, of course, it will illuminate each one of the film sound band lines separately, or very nearly so.

I think you get the idea, do you not? I might, however, add that the reduction is such that the slit image length is just a trifle less than that of the sound band lines.

Up to this point in re-reading what I have written, it seems as though I have succeeded in making the matter at least fairly clear. Now follow closely and we will proceed.

We now have a tiny, brilliant line of light, approximately the length and width of the sound lines upon the sound band of the film, incident upon the sound lines as they pass through the sound gate. It then follows that each of these lines is illuminated separately, or very nearly so, as it passes through the light line.

Now these lines on the sound band are heavy or light and wide or narrow in exact proportion to the loudness and pitch of the sound which caused their creation. Get that, dont' you? All right! As the light passes through each of them a proportion of it is absorbed—a proportion exactly in proportion to the width and density of each line—so that beyond the film we have a light beam varying in intensity precisely in accordance with the original sound effect as impressed upon the film, but in reverse.

This beam passes through the photo-electric cell and in so doing (here is the heart of it all) sets up electric currents varying in strength precisely in proportion to the variations in the light density of the beam from the sound band of the film. This current is passed along to the amplifying tubes and from there to the loud speakers.

That, gentlemen, is how the thing is done, though of course there is vastly more to it than appears in this short article designed merely to show you why you must not monkey with the slit cell.

And now for the dirty work: You who have followed me thus far will understand that the slit image must be precisely parallel with the sound lines. You will clearly see that "precisely" in this case means exactly that. You will understand that if you take the slit tube out and in replacing it get it rotated by even so little as one-hundredth of an inch, then the slit image would not be exactly parallel to the sound lines, hence it would only illuminate properly at its center. At either end it would be out of register, with result that the sound would be blurred in proportion to the amount of the fault.

You all know the effect of a slight movement of the projector objective lens backward or forward. Well, absolute sharpness of definition in the slit image is very essential to the best results and if you remove the tube in replacing it even the least bit too far backward or forward, the slit image will be out of focus and the sound correspondingly blurred.

You begin to see reasons why you should **not** break that slit cell seal, do you not? The cell must be set with microscopic precision and the projectionist is not equipped to work with certainty in such a matter. It is extremely unlikely that you would or could succeed in correctly re-locating it, hence both the Western Electric and Fox Case ask that you do not make the attempt. It is a factory or a service man's job exclusively, wholly and entirely. Get your service man on the job if you suspect anything is wrong with the slit cell. Don't attempt the impossible.

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## *Win Praise*

It is a fact that some projectionists complain that the "boss" seldom or never speaks in commendation of their work.

In some cases this may not be readily excused because the projectionist is a careful, painstaking man who tries hard to give the best possible service. I know that to be a fact.

However, my brother, before you complain too vigorously about neglect by the "boss" in this respect, take counsel with yourself. Ask yourself if you really have done anything worthy of comment by the boss. Remember that you are only justly entitled to notice and praise if and when you have gotten as nearly as possible one hundred per cent. results with what is provided, and have done it efficiently—without undue cost either in electric power or machinery deterioration.

Think that matter over carefully. Ask yourself this question: Have I done everything possible to equip myself with accurate knowledge to the best possible advantage, or am I one of those men who believe in giving the least possible value in return for the highest possible wage? Do you regard projection as consisting merely in the operation of a machine, or do you regard it as a matter of placing the very best possible picture before the audiences at all times, which same involves hard work, study and painstaking care? Praise is a thing to be won and won by real, sustained effort to excel.

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A sound gate is different from a baby. A baby will howl if you clean its face. A sound gate will howl if you don't.

## FLICKERS

The other day a father of recent twins was talking to us. He was deeply interested in the perfect synchronizing marvel of movietone. He asked a lot of technical questions about it. He wanted to know this and that about the mechanical part of it. We couldn't imagine why he was so inquisitive. Finally we asked him. We learned he was trying to apply the principle of synchronization to the nightly yowlings of his young two-some.

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Your personal importance is something that should not give you much worry. If all you want is for people to look up to you go and sit on a flagpole.

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Of course the producers of movietone want it noised around. But they don't want it noised around too loudly. That is why they put the fader on it.

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If you don't know how to keep oil and dirt off the celluloid strip consult a reformer or a censor. What he doesn't know about clean films hasn't been thought of.

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Be square with yourself. Ordinary politeness is to be desired. But it is not bad etiquette to stare a fact right in the face.

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Don't be discouraged. All signs fail in dry weather, they say. But the high-sign generally works in a dry country.

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No matter how much you think you know, there's more to learn. Experience is the best teacher, but she never lets anybody graduate.

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Synthesis means building—hence, anything synthetic is built from the ground up. A lot of blondes are synthetic.

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It is wise always to give a big share of interest to your work, unless, of course, you are a savings bank.

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Stick to one thing. A jack-of-all-trades never makes much jack at any of them.

# MOVIETONE BULLETIN

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## *Balance Your Sound*

ONE hugely important function which must be judged by the theatre manager, but should be very carefully watched and checked by the projectionist, is the balancing of sound in the auditorium.

By this I mean the matter of supplying exactly the volume of sound that will give the best general effect when all parts of the theatre are considered.

This is an important item in sound projection. In theatres having great depth, for example, we may not hope to have absolute perfection in all its parts, because of the fact that the volume which will give perfect results at the rear will inevitably be somewhat too high for the best possible effect down front.

Even so, however, we have the advantage of the spoken drama because of the fact that whereas we may be unable to secure perfection in all parts, still we are able, by careful work, to supply acceptable sound throughout even the largest auditorium.

Take for instance some of our Great White Way picture palaces. It is impossible for any except those having very acute hearing to be at ease when seated at the rear and a speaker or singer is on the stage. If those without acute hearing are able to hear at all, it is at the expense of considerable and very uncomfortable strain.

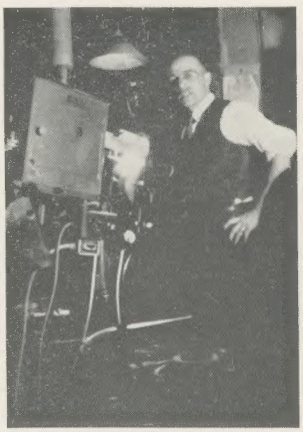
With movietone, however, no such difficulty exists. The volume may be made such that even those of ordinary hearing may follow the dialogue or song from the rear seats without any strain whatsoever, and that, too, without giving those in the front seats any objectionable surplus of sound.

And right there comes the point I am discussing with you. It is up to the manager and projectionist to see to it that the sound volume is so regulated that the best possible results may be had, which ordinarily means that it must be so adjusted that those of normal hearing seated in the rear seats may be able to hear without conscious strain. Others must seek seats closer to the screen, of course.

There is room for the exercise of a great deal of judgment in this

(*Continued on Page 2, Col. 2*)

### Bay State Adds Projectionist Photo



*Movietone is the talk of the town on the old Fall River Line. Projectionist* RAY T. GAGNON, *above, of the Bijou Theatre, Fall River, Mass., sees to it that it is not idle talk.*

## *Chasing Dirt Deposit*

BECAUSE of the constant addition to our family of movietone projectionists and because of the vital importance of the matter, we frequently reiterate the sound sprocket-sound gate warning.

Never thread in a movietone film until you have first made very certain there is no bit of deposit adhering to the slot in the sound gate. If there is, even though it be too small to do actual damage at the time, you may be certain it will build up rapidly and work serious harm to the sound band before the reel is finished.

Then, too, a bit of gum or dirt adhering to the face of one of the rims of the sound sprocket will have the effect of throwing the sprocket out of round, in so far as concerns its action with relation to the film. It then will cause the film to move just the least bit too far once for each revolution of the sprocket, and that movement will cause the sound to fluctuate, the amount of fluctuation being in proportion to the amount of the deposit.

The best way is to have a good stiff-bristle brush—a tooth or nail brush will do—and give this sprocket a good scrubbing with it each time before you thread the film in. Dirt on the sound gate is best removed by using a damp finger or cloth. Never scrape it off, as that is likely to roughen the metal and increase the tendency to deposit.

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Movietone is a little like Old Lady Grundy. Don't tell it anything you don't want repeated.

## *Likes Movietone*

FROM the Northwest comes this letter: "Dear Brother Richardson: The bulletin certainly is great stuff. It helps a lot. Also that article you published in the Herald-World and in the American Projectionist is more than good. Keep up the good work.

"I have had experience in projecting sound both by movietone and the disc record method and I like it. It puts a lot of pep into the work that was lacking before. But when it comes to the two systems, I for one very much prefer movietone. I say without hesitation that it is much the better of the two. Movietone is improving constantly. It has got to the point where in all but a few occasional news reel shots which plainly were taken under difficulties, and could not have been taken at all by the disc method, the movietone sound effect is fully equal to that of the disc. In my opinion it is often much better.

"And with movietone we always know the sound is in absolutely correct synchronization without squinting constantly at the screen to see some discrepancy, or depending upon a not always reliable observer to do it. I'm a movietone projectionist and I don't care who knows it. I'm one of the "family" and right proud of it too."

Well, brother, we're right glad to have you, but why in (deleted by censor) didn't you include permission to publish your name? I fully agree with you that the film method is best. I have always said, since the very beginning, that sound in synchronization with motion pictures would not be largely successful in any general way until the sound was on the film itself. Then along came movietone and when I first heard its then comparatively faulty performance I had faith to believe the sound-on-the-film method had arrived.

I was really more genuinely pleased that I have been by any other one thing in years when Mr. Sponable, Technical Director, sent for me and invited me to join the movietone staff of the Fox Case organization as associate editor of the Bulletin, which title was later changed to editor.

My pleasure was due to the fact that I thoroughly believed in movietone and in its future. I also want to say to you that I have found the men at the head of Fox Case Movietone to be firm believers in their product and willing to go the limit to give you the very best possible in the films; also I can vouch for the fact that they are willing to do any reasonable thing to help the projectionist place it before the public in the best possible manner. They are on the square, boys, absolutely, and it's up to you to be on the square with them and place movietone on your screens one hundred per cent.

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## *Proper Fader Notch*

WHEN a fader cue sheet is made from sound indication in an empty auditorium, don't forget that you must in nearly all cases use the cue one or two points higher than its actual radius. Unless you pay attention to this the sound most likely will be too low.

The reason for this is simple. A congregation of one to two or three thousand people makes a great deal of noise, though it seldom is noted unless it be deliberately listened for. Even then were it possible to instantly dissipate the audience you would probably be astounded at the great difference.

Another contributing factor is the fact that thousands of bodies offer considerable resistance to and tend to interfere with and break up sound waves. You therefore must, as we have intimated, use the empty auditorium cue sheet from one to two or possibly even three points higher than its actual reading. The careful projectionist will also remember that if it is found the best result is had from a 3-point raise when the auditorium is full, a point lower will probably be better when it is half empty.

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*(Continued from Page 1, Col. 2)*

matter and in more than one instance I have found evidence that it has been handled rather carelessly. It must be considered in the cueing of each production. **Care in sound balancing means added dollars paid in at the box office.** People will come more frequently if it is found there is enjoyment unalloyed by any sense of strain.

## FLICKERS

Remember back in the old home church how the choir leader wanted everybody to join in the chorus? That's how a fellow feels when he goes to one of these palpitating musical shows.

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Projectionist Pete says he knows a guy who ought to quit projection work and go into politics. He uses so much oil on the apparatus it looks like Teapot Dome.

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Projectionist Pete is all enthused over an idea for an invention. He is going to invent a tail light for advice so it will be easier to follow.

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If the guy next door practices on the saxophone all the time and keeps you awake, make a movietone of him and play him back at himself. He'll stop in self-defense.

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Nobody can know all there is to know. A hair divides the false and the true. These days of course it is a bobbed hair.

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Movietone is a marvel and promises great things to the world. But think what would happen if they got to making talking photographs.

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And, among famous standing offers, by no means least is the S. R. O. sign managers love to hang out.

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Don't give up if you haven't found yourself. Every man has his calling. That's what telephone operators are for.

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If the poundage piles up don't try to argue with the scales. It has it own weigh of doing things.

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If you are perplexed, use your head. That's what made the billy-goat famous.

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The most important gates known are: Pearly gates, Golden Gate and sound gate.

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Don't be dumb about the details of your business. Even a hamburger man knows his onions.